

# Bruce (Shidi) Xi

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## Education

### The University of British Columbia

Vancouver, BC

*Master of Engineering in Electrical and Computer Engineering*

2021–2024

- Research project: Multi-agent Deep Reinforcement Learning for VLSI Routing
- Relevant courses: Deep Learning, Computer Architecture, CNN Hardware Accelerator, Digital System Design

### Imperial College London

London, UK

*Bachelor of Engineering in Materials Science and Engineering*

2018–2021

- Graduated with First-Class Honours
- Obtained Dean's List for three consecutive years (2018–2021)

## Project

### Multi-agent Deep Reinforcement Learning for VLSI Routing

May-Oct. 2023

- Demonstrated initiative by independently mastering DRL and VLSI global routing through exhaustive self-study and comprehensive literature review
- Successfully modeled and implemented the physical routing problem in Python
- Designed an innovative multi-agent DRL model to address the routing challenge, leveraging the sophisticated capabilities of Python libraries

### Embedded System Design

Jan.-Apr. 2023

- Designed key components of an embedded system including a 4-way set-associative cache controller and a DRAM controller using Verilog. The cache reduced the runtime of a benchmark by 43%
- Implemented the system on an FPGA with a provided soft microcontroller
- Developed software and firmware in C that interacted with hardware using SPI, IIC, and CAN protocol
- Utilized hardware timer interrupt and designed a snake game software that ran on the embedded system

### CPU Architecture Design

June-Sept. 2022

- Architected and crafted a 16-bit RISC CPU from the ground up using Verilog, integrating pivotal components such as FSM, datapath, RAM, and I/O interfaces
- The CPU supported 13 diverse instructions encompassing ALU operations, memory access, and branching mechanisms
- Successfully deployed the system onto an FPGA and validated the design's capabilities by executing a test program

## Experience

### Motorola Solutions

Vancouver, BC

*Design Validation Co-op*

May-Dec. 2022

- Orchestrated a comprehensive range of camera tests, ensuring precision both in lab settings and office environments
- Developed Python-based software, realizing test automation and data analysis, resulting in a significant enhancement in test efficiency. Some tests achieved automation of up to 90%
- Collaborated effectively within a team framework, leveraging tools like Git and Jira for optimal workflow management

### University College London

London, UK

*Undergraduate Research Assistant*

June-Aug. 2021

- Played an integral role in the research team by meticulously taking measurements and preparing samples
- Demonstrated analytical skills by independently evaluating vast datasets and presenting insights effectively to the research group, fostering informed decision-making

## Skills

**Hardware:** Verilog, FPGA, Assembly, Cadence

**Software:** Python, C, Linux, Git, Deep Learning, Reinforcement Learning

**Research:** LaTeX, Academic and Technical Writing, Mendeley